Chapter 7
Alternatives Analysis

Four transportation network alternatives were developed by the Steering Committee. Each places emphasis on different community values. Using the congestion measurements identified in the previous chapter, a preferred alternative can be determined.

Introduction to Developing Alternatives

In the previous chapter, the baseline of socio-economic information and travel measurement tools have been established for the Study Area for 2007 and for planning year 2040. Now is the time to develop and evaluate transportation network alternatives. Four alternatives were developed, in collaboration with the Project Management and Steering Committees, to be considered by the Working Groups and the public at large. Each alternative has a theme that is reflected in the different mix of collector, arterial and freeway roads along with a mix of transit options. Each of the transportation network alternatives was modeled, analyzed and compared to the 2007 existing and planning year 2040 transportation network performance measures to give a range of planning options for consideration.

Baseline Assumptions

As part of the modeling effort, capacity improvement projects were included from the 2008 - 2013 Transportation Improvement Program (TIP), 2008 - 2013 Statewide Transportation Improvement Program (STIP), along with projects currently under construction such as the widening of I-15 in Davis and Weber County and the FrontRunner commuter rail project. These projects are collectively referred to as "existing" and "committed projects." The existing and committed projects were modeled

Transit to downtown Ogden was included in every alternative.

with the 2040 socio-economic data and are the basis of the analysis in the remainder of this report. It should be noted that a number of projects have not been included in the 2040 modeled transportation network because they do not increase capacity through new construction. Typical projects in the STIP, but not included in the modeling effort are the following:

- Parking
- Bridges
- Preliminary Engineering
- Planning
- Pavement

The Level of Service (LOS) analysis of this study and the WFRC Regional Transportation Plan (RTP) projects are used as a comparison to the committed projects. The RTP includes projects planned for, but not necessarily funded, to the year 2030.

Transportation Alternatives Overview

In order to determine which grouping of projects would provide the best east-west mobility in the northern Davis and Weber Counties, transportation alternatives were developed for consideration by the Steering Committee, Working Group members, and the public at large. Each alternative package was created with a focus on relieving projected east-west transportation demands and associated congestion based upon the growth in the Study Area described in a previous chapter.

The alternative packages were developed and analyzed so as to lead to a preferred set of projects that would be recommended to UDOT by the Project Steering Committee and reviewed by the Working Groups and members of the public in an open house forum. These projects represent a long term, 2040, vision of transportation improvements in the Study Area.

Description of Process and Criteria for Selecting Projects for Each Alternative

At a Steering Committee meeting in December 2007, facilitated by members of the Consultant Team, participants discussed what would be the appropriate parameters of the Davis Weber East-West Transportation Study. The key discussion areas included:

- Economic development
- Environment and quality growth
- East-west vs. north-south mobility
- Funding
- Mobility and multi-modal options
- Safety

The discussion among the Steering Committee members helped the Consultant Team members to define necessary parameters to develop transportation alternative packages for consideration that reflect local values and knowledge. The overall attitude of the Steering Committee was that they wanted to be more visionary as opposed to reactionary when handling the upcoming transportation needs of the burgeoning population. The discussion of specific key areas provided valuable local information and values to the Consultant Team which guided the selection of individual projects rolled into different alternatives.

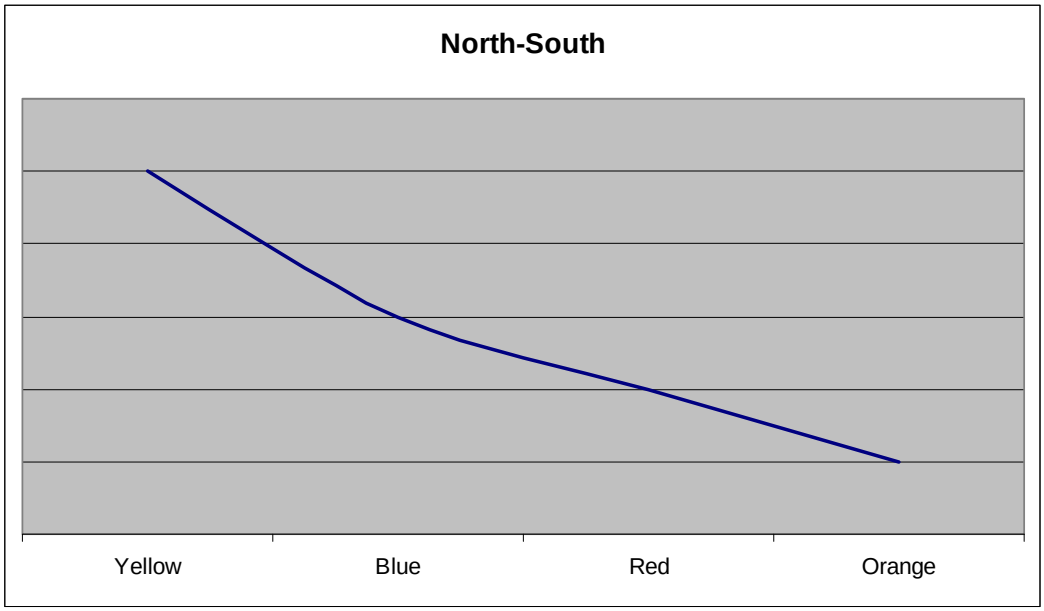
Each of the four transportation alternatives represents a separate vision of the future transportation network in the Study Area; each alternative has a mix of capacity enhancing roadway and transit projects. When viewing the individual projects included in each transportation alternative, there is a high level of similarity. However, it should be noted that the unique design of each project in each of the transportation alternatives is different. For example, the SR-67 Extension project is reflected as an arterial in some alternatives and a freeway in others. The outcome of a project's unique design results in four transportation alternatives that perform very differently and reflect a separate future transportation network in the Study Area.

Steering Committee members prepare for a meeting.

The graphics for the transportation alternatives were developed along with a narrative to assist the attendees of the public open houses to imagine in their mind's eye the alternative presented. Overall, there are general trends to each transportation alternative. The following simple graphics show how each package of transportation improvements perform along five indicators:

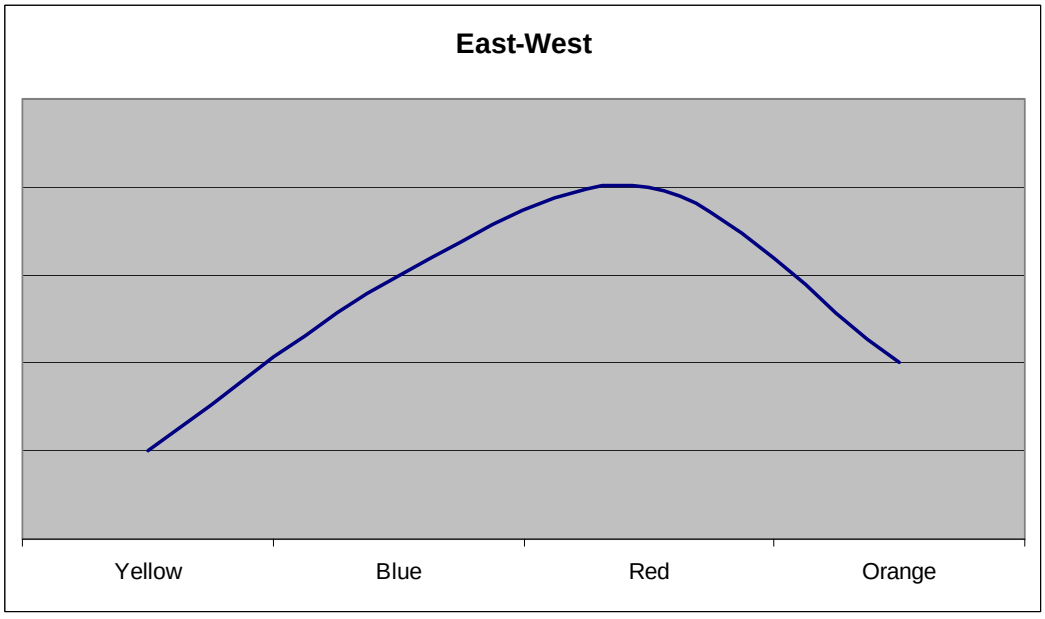
- North-South travel
- East-West travel
- Level of transit
- Cost of transportation improvements
- Walkability or pedestrian friendly

Figure 19: Alternative's Emphasis on North-South Travel



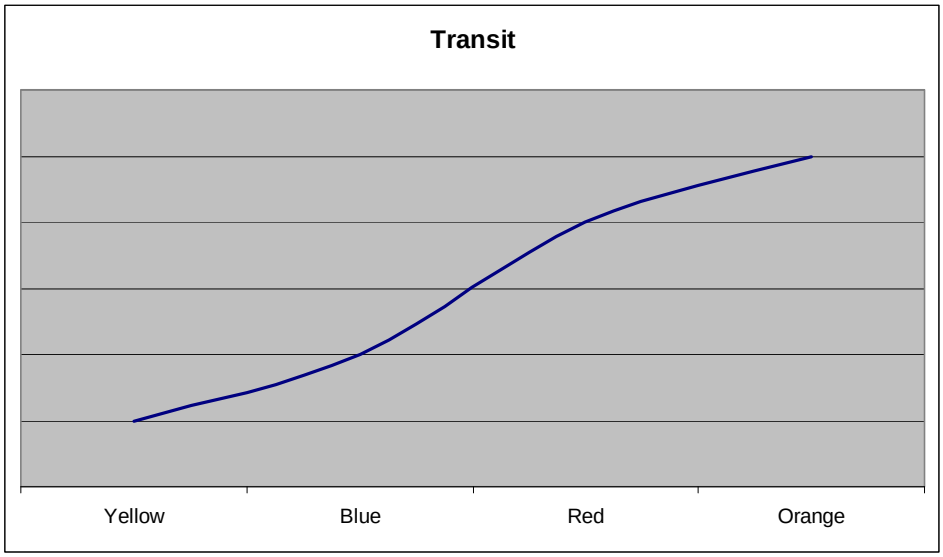
This graphic illustrates that the Yellow Alternative provides for the greatest emphasis on north-south travel with the Orange Alternative providing the least.

Figure 20: Alternative's Emphasis on East-West Travel



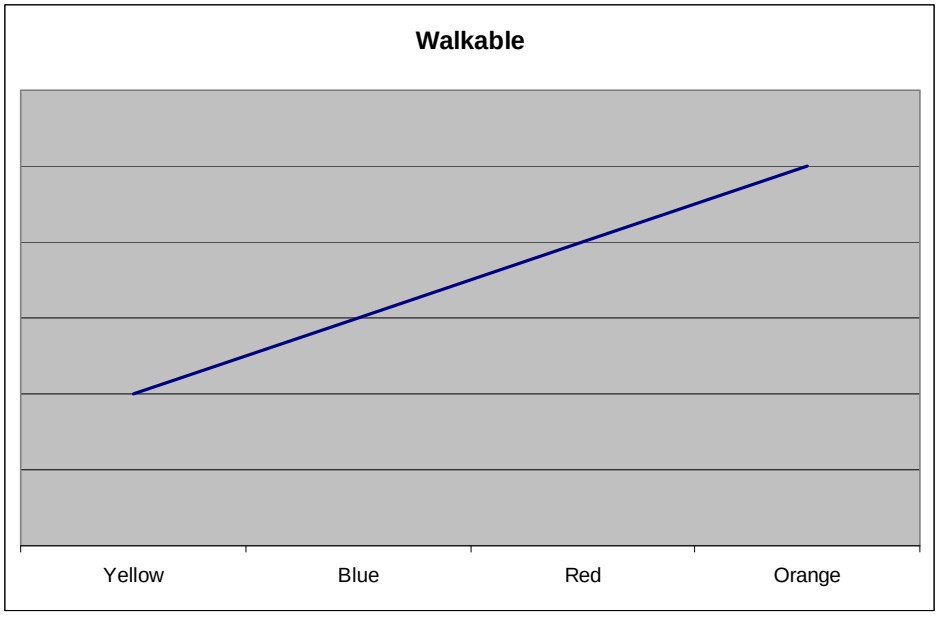
This illustration shows that the Red Alternative provides for the greatest amount of east-west travel.

Figure 21: Alternative's Emphasis on Transit



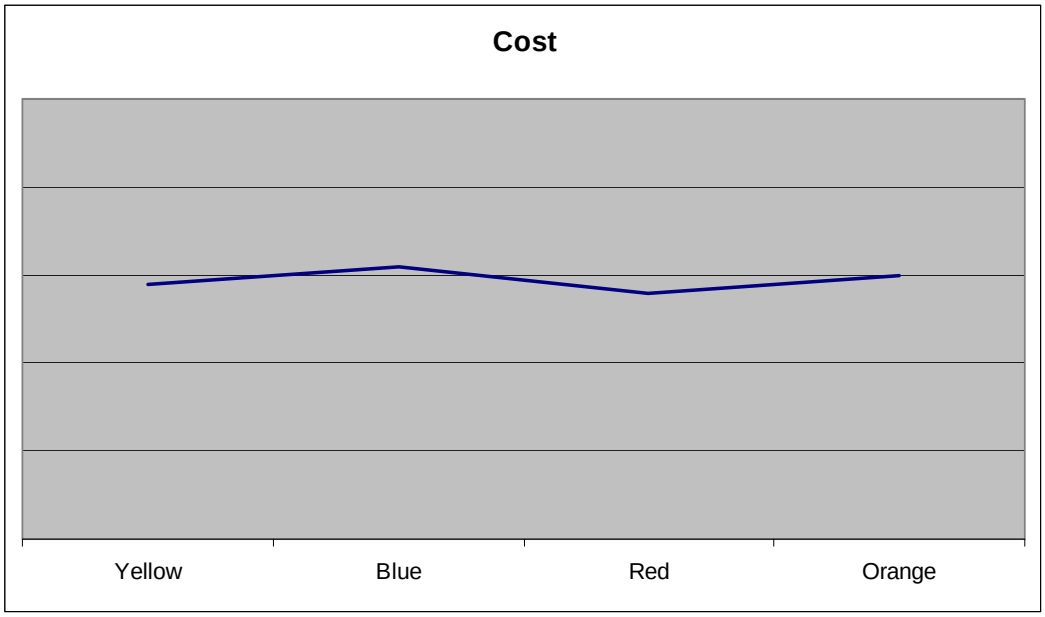
When examining the role transit plays in the future transportation network in the Study Area, the Orange Alternative contains a considerable amount of transit for use by local residents. Conversely, the Yellow Alternative provides very little consideration to transit alternatives to help individuals get to where they need to go.

Figure 22: Alternative's Emphasis on Walkability



This graphic shows that the Yellow Alternative provides the least walkable environment for individuals wishing to walk to their destination. It is clear to see that the Orange Alternative provides the most walkable environment.

Figure 23: Alternative's Emphasis on Cost



The total cost of each transportation alternative is roughly similar.

Description of Alternative Project Packages

Individual transportation improvement projects, including highway and transit improvements, have been grouped together into four different themed packages. As indicated before, the various transportation alternative packages propose to relieve projected east-west travel demands and problems that have, and will, develop as a result of the growth in the Study Area.

Each individual project within a specific alternative has been detailed to identify the planning level project cost, degree of proposed access control, the approximate environmental or social impact, and the relative community acceptance. What follows is a description of each transportation alternative developed collaboratively by the Consultant Team with the identified stakeholders participating in the Steering Committee and Working Groups. The first paragraph in each alternative is the narrative that accompanies the maps that provide a graphic illustration of the proposed transportation alternatives featured.

Description of Yellow Alternative:

Narrative accompanying Yellow Alternative map:

In 2040 we want to… be able to get to and from Salt Lake much more easily, quickly, and safely than we do now. We want the convenience of doing our grocery, clothing, hardware, automotive, and home improvement shopping in the same area, and feel we don't have enough of those centers available now. We also don't mind driving a bit to get there since we can get it all done in one trip. We want to be able to get to the commuter rail without too much trouble so we can use our cars a bit less and improve air quality. We're willing to spend money to have good roads and expect our politicians to place high value on transportation.

Basically, the Yellow Alternative focuses on increasing the number of roads as well as widening others to make it more accessible for motorists to get where they need to go quickly. For example, SR-67 Extension, by 2040, becomes a six lane roadway in order to offer more north-south travel options for residents in the western areas of Weber and northern Davis Counties. In this alternative, motorists have several options such as I-15, SR-67 Extension and commuter rail when traveling from Ogden to Salt Lake City and areas south. The Yellow Alternative focuses more on north-south travel rather than east-west. Commuter rail is fully operational in this alternative, but access to local transit is limited. All the intersections along I-15 will be upgraded to create quick and efficient movements when accessing or exiting from the roadway.

Ogden Industrial Depot, photo taken from plane August 8, 2008.

Description of Blue Alternative:

Narrative accompanying Blue Alternative map:

In 2040 we want to… feel like we can get to Salt Lake or Ogden by car, train, or bus with relative ease. We want to be able to get to and from the commuter rail stops nearly as easily as we can get on the freeway. We would like to see shopping areas built around job centers so we can keep commerce localized. We know there will be increased congestion, but we think buses and other transit will help minimize it. We want to maintain high-speed roads, like freeways and wide arterials.

In the Blue Alternative there is still an emphasis on widening and building new roads, but this alternative introduces local transit options and begins to balance east-west with north-south transportation improvements. Now individuals will be able to travel from the Ogden area to Salt Lake by car, bus or commuter rail. For example, downtown Ogden will be served by a Bus Rapid Transit (BRT) route that connects the Ogden Intermodal Transit Hub with Weber State University allowing faculty, staff and students more options to access the campus as well as destinations along the way. The interchanges along I-15 will be evaluated individually to determine what type of upgrade would be necessary to provide for efficient flow of traffic that meets the capacity needs of the roadway.

Looking west from the mouth of North Ogden Canyon

Description of Red Alternative:

Narrative accompanying Red Alternative map:

In 2040, we want to … work and play a bit more in our own communities, and build up Ogden, and to a lesser extent Layton, Riverdale, and Clearfield as our regional centers rather than always going to Salt Lake to enjoy "big-city" life. We want it to be easier to drive from one town to the next. We want to build flexibility into our transportation plans so we can adapt to funding priorities and scale our plans depending on funding availability. We want to be able to get east and west across the big freeways more easily and safely-whether in cars, on bikes, or even on foot. We don't mind some congestion due to north-south commuting if it helps promote policies toward focusing regional development in this area.

The Red Alternative focuses on east-west over north-south travel. Regional transit allows for connectivity to larger metropolitan areas to access cultural activities, shopping, recreation and other needs. Residents have more options to travel via other modes of transportation, including walking, because building new or widening roads is less important than it once was. Light Rail is now a part of downtown Ogden and a BRT loop connects it with the Ogden Intermodal Transit Hub.

The Red Alternative is able to accommodate regional growth because it provides large dense urban areas, such as Ogden, along with lower scaled mixed-use developments in the outlying or rural areas that are connected by transit. By being able to use various modes of transit, there is less automobile use, and air quality will improve. This Alternative upgrades several interchanges on I-15 and clearly focuses on transit.

Small strip of land between Great Salt Lake and Wasatch Mountains in Davis County, photo taken from plane August 1, 2008.

Description of Orange Alternative:

Narrative accompanying Orange Alternative map:

In 2040 we want to… live and work in the same community. We want it to be easy to get to and from work, and to do errands by having many options to get around by car, bus, bike, or walking. We want to plan our transportation in a way that can be scaled to our needs, and funded appropriately. We want to be able to easily get to Ogden, Layton, Clearfield, Riverdale, and other job centers in our communities and feel that our transportation facilities should always begin and end at a pedestrian scale, provide direct paths to our commercial centers, and be scaled to the size and most efficient travel mode of each center.

The Orange Alternative provides many different mode choices for travel. Transit and non-motorized modes are the dominant themes for this alternative. Some of the transit routes included are Light Rail extending from North Ogden to downtown Ogden along Washington Boulevard. A secondary light rail route connects the Intermodal Transit Hub to Weber State University. A BRT loop will begin at Hill Air Force Base that will serve the Clearfield and Roy commuter rail stations and will have an extension that serves the communities along the way before its final stop at the Farmington commuter rail stop. Local bus service is also increased so that headway, or time between buses, is short. All I-15 interchanges are upgraded to provide ease in accessing and exiting the freeway.

Growth in Weber County

Figure 24: Yellow Alternative

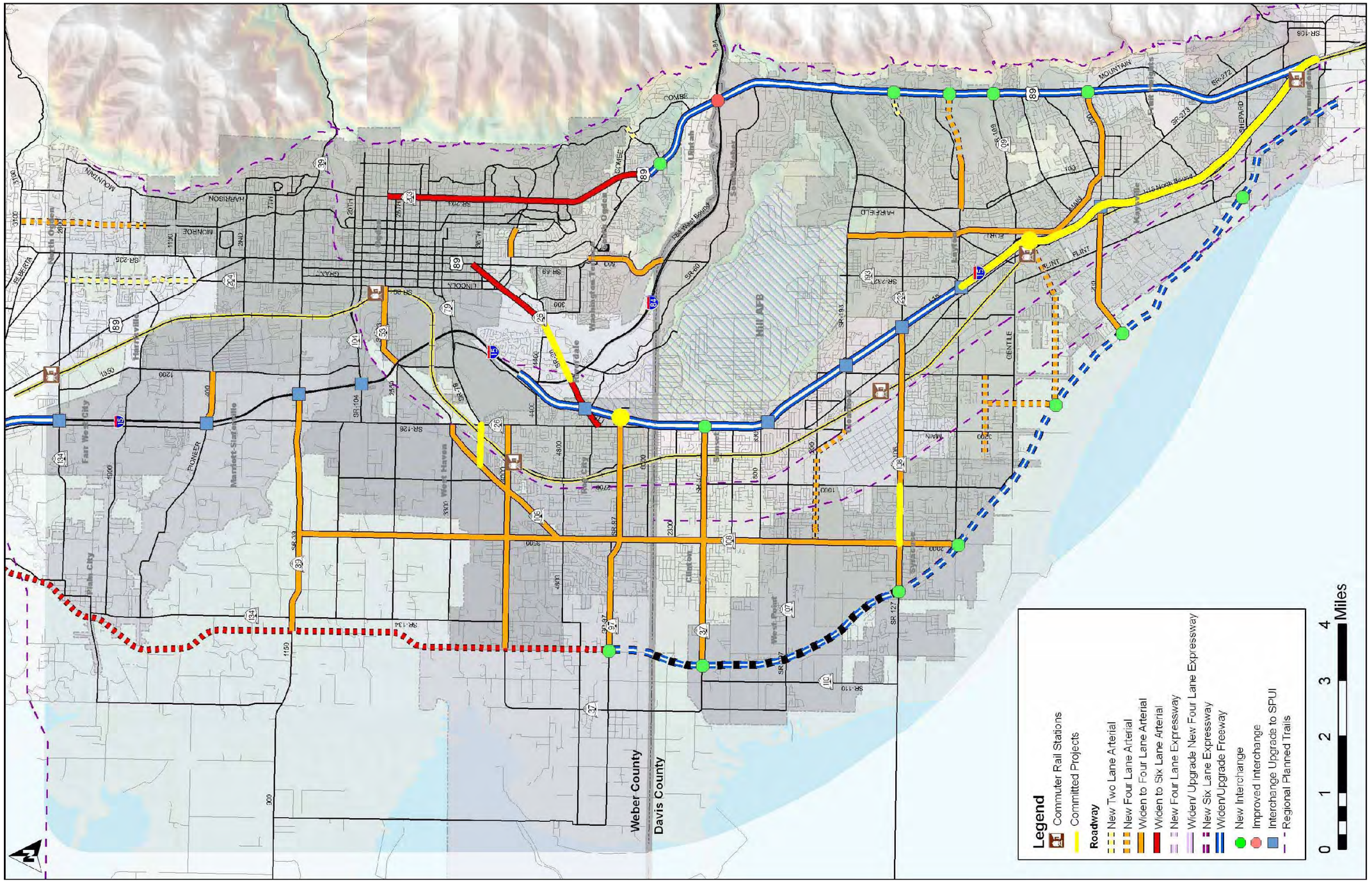


Figure 25: Blue Alternative

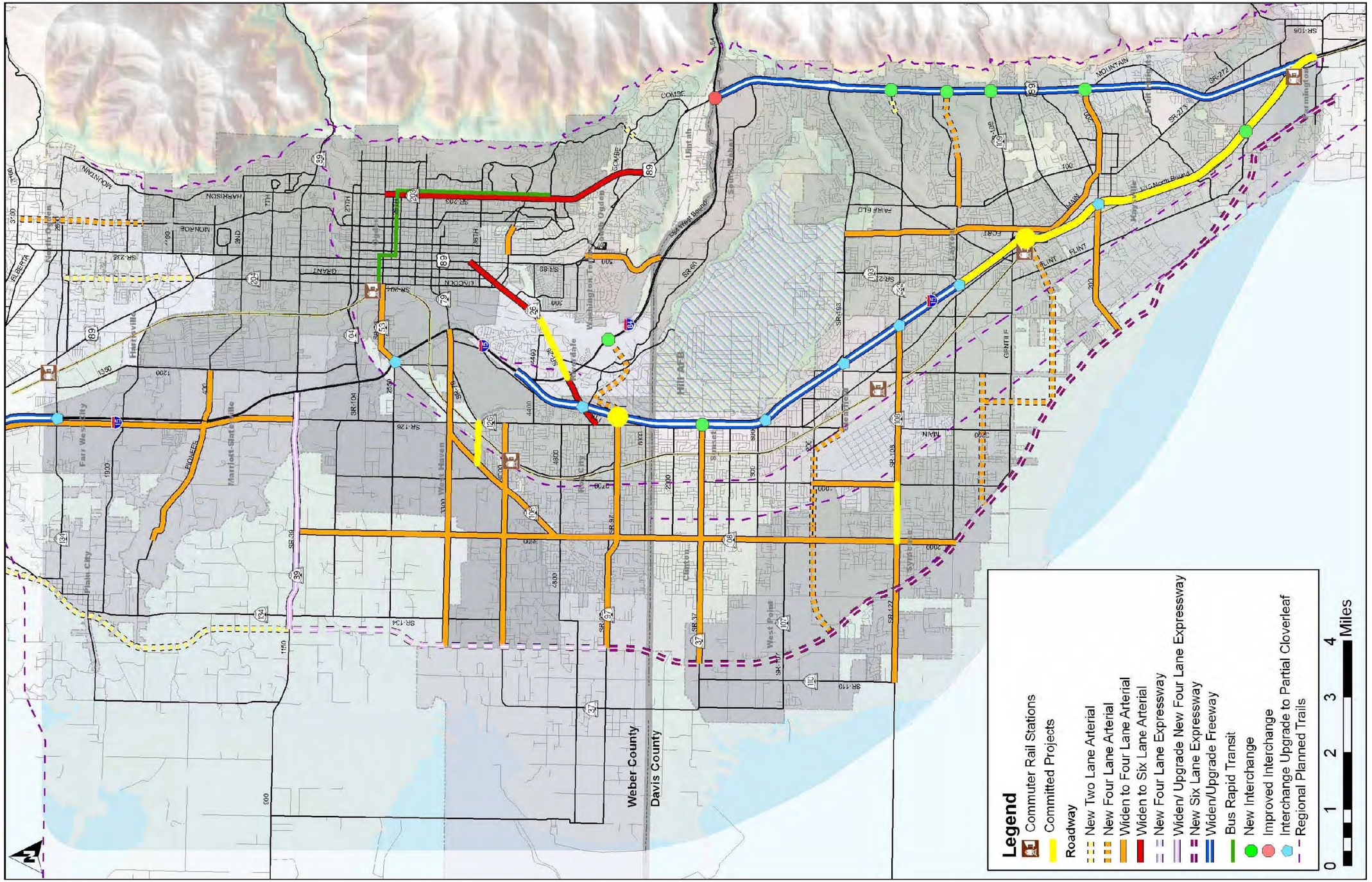


Figure 26: Red Alternative

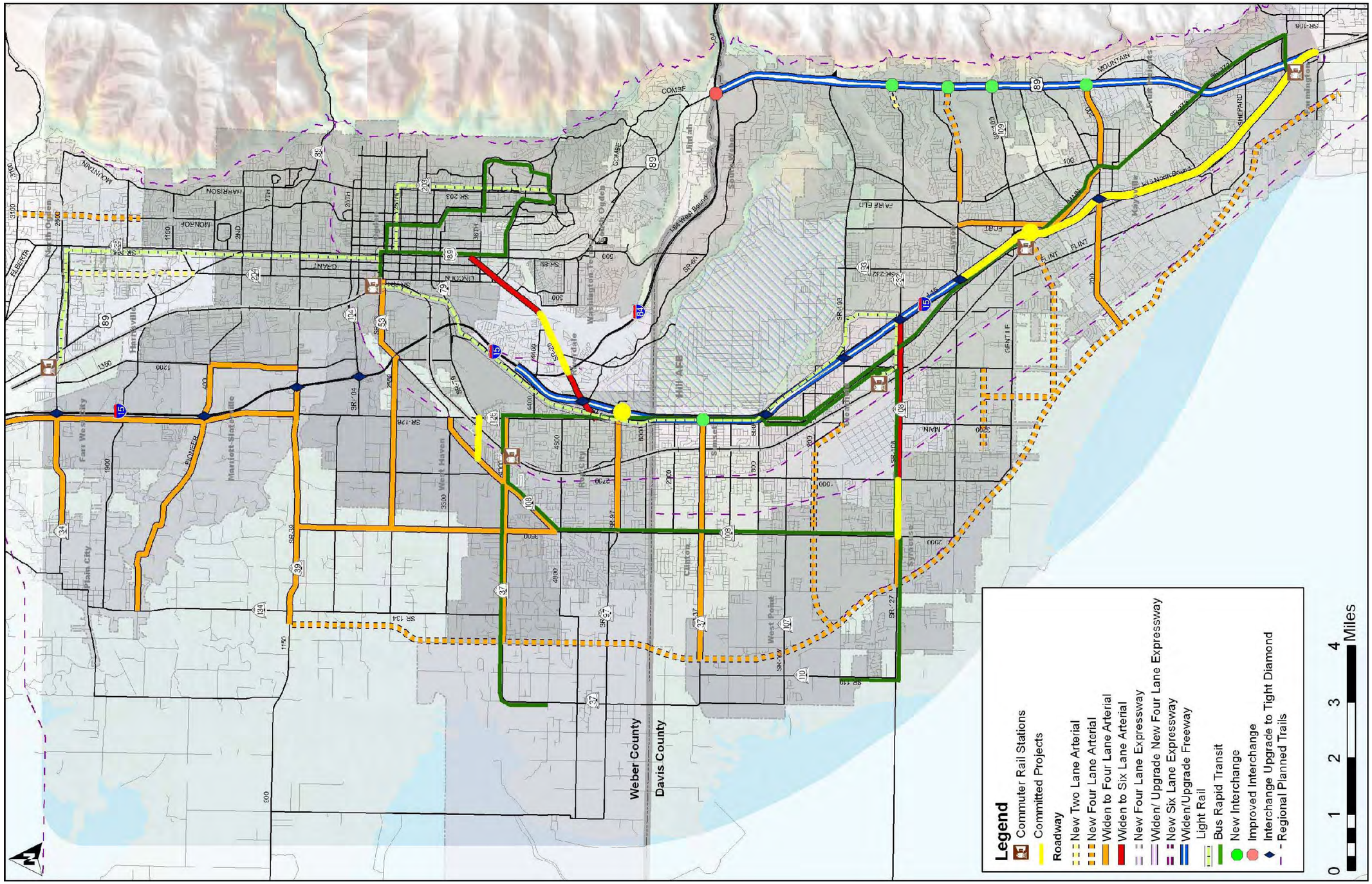
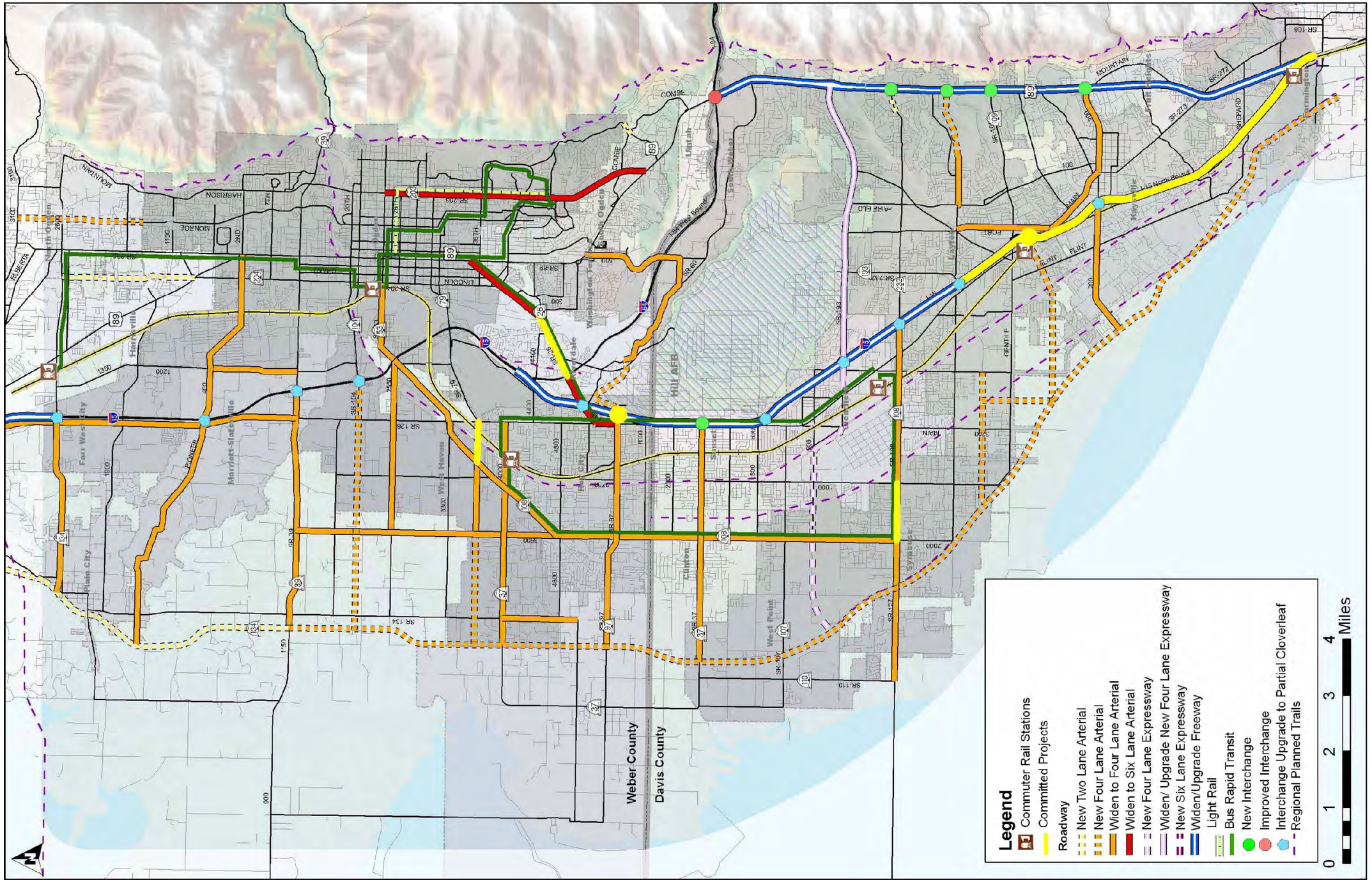


Figure 27: Orange Alternative



Evaluation Measures for Selected Alternative Project Packages

The tools used to evaluate each transportation alternative package are introduced in this section. These evaluation measures were first introduced in an earlier chapter, but are provided here for ease of reference. A more expanded discussion of each evaluation measurement is provided in the future conditions chapter of this report.

- Travel Time Index (TTI) – refers to a measure of congestion determined by dividing the time it takes to travel a given road segment at the peak hour, by the free-flow travel time for that segment. A TTI of 1.00 indicates that there is no difference between travel time on a given road during the peak hour and free-flow time. A TTI greater than 1.00 is representative of peak hour trips taking longer than non-congested travel.

- Level of Service (LOS) – standard measurement used to identify the amount of congestion on a given roadway. Level of service is given grades of A through F, with A being free-flow conditions and F being highly congested, "parking lot" conditions.

- Vehicle Hours of Travel (VHT) – a calculation of the total time all vehicles spend on the transportation network in an average day. This measure is obtained from the regional travel demand model and helps to identify area-wide congestion changes.

- Vehicle Miles Traveled (VMT) – a measurement of the total vehicle miles traveled.

- Congested Speed – Average speed across all roadways during a weekday during the peak travel hours from 3:00 p.m. to 6:00 p.m.

- Free Flow Speed – Average speed across all roads during a weekday where there is no congestion and no adverse conditions exist.

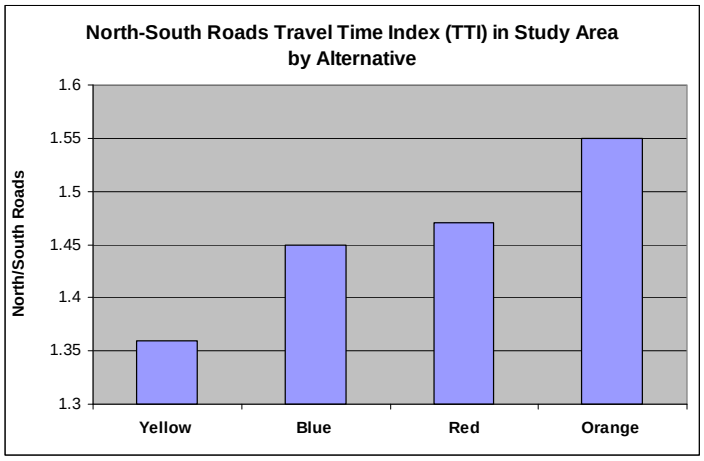
- Transit Trips – a calculation of the number and percent of transit trips by alternative.

- Trips exiting south – a calculation of the number and percentage of trips headed south.

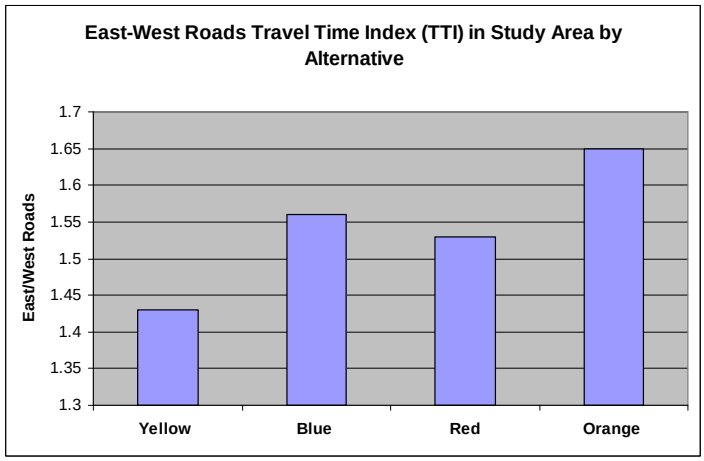
The travel demand model, year 2040, is evaluated for each alternative.

Figure 28: Travel Demand Model Results

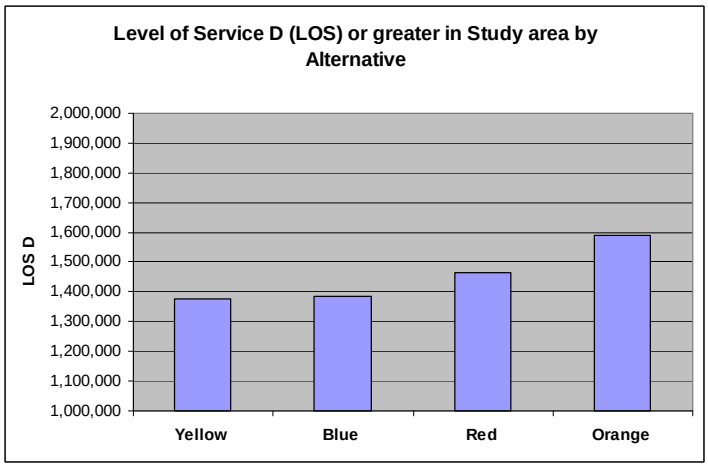
Travel Time Index (TTI) North-South



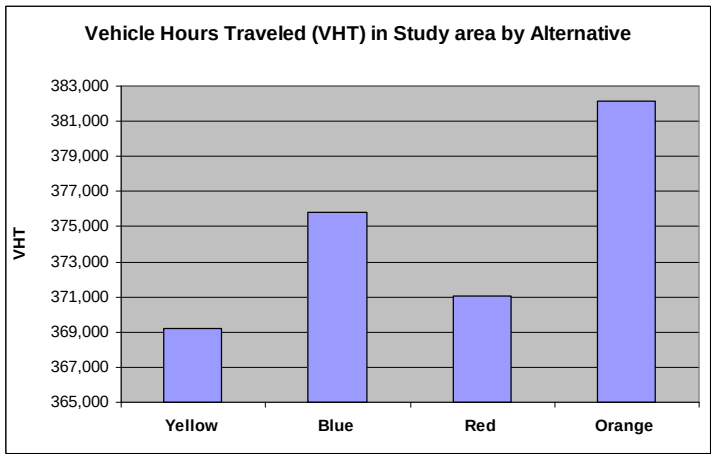
Travel Time Index (TTI) East-West



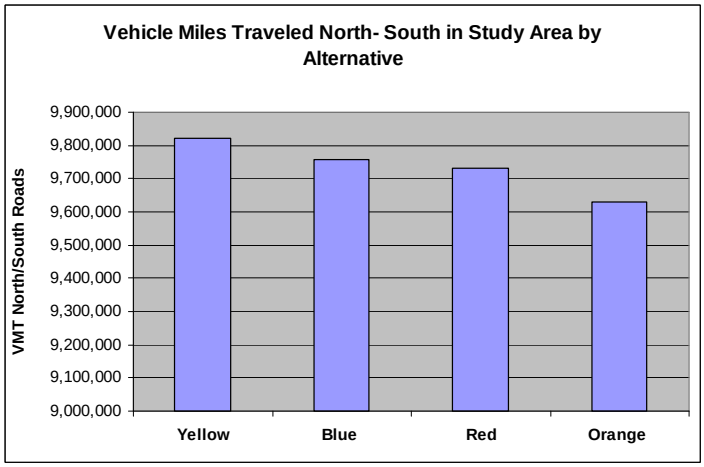
Level of Service (LOS D) Weekday Miles



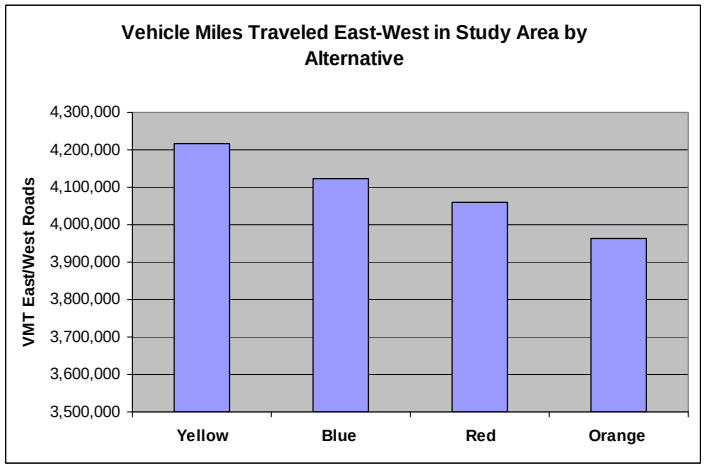
Vehicle Hours Traveled (VHT)



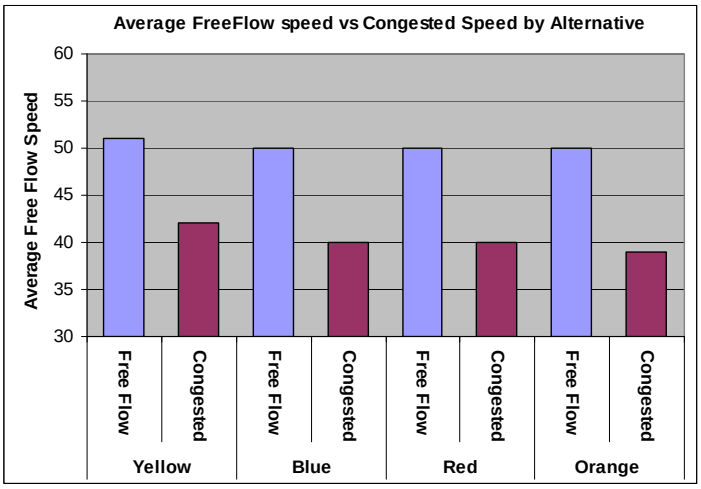
Vehicle Miles Traveled (VMT) North-South



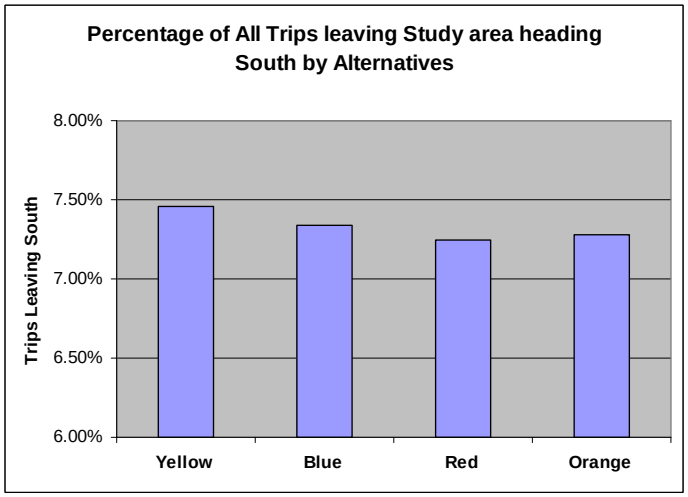
Vehicle Miles Traveled (VMT)East-West



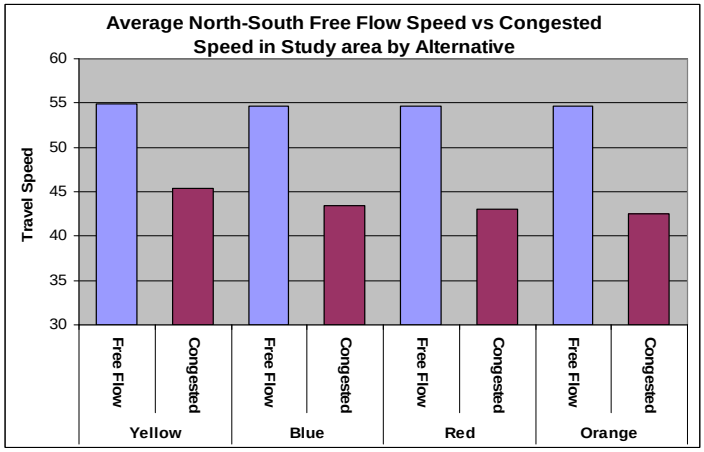
Average Free Flow Speed versus Congested Speed



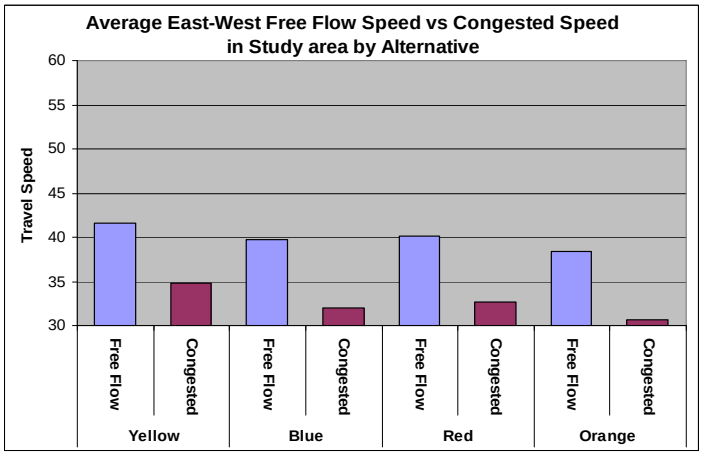
Trips Leaving Study Area Heading South



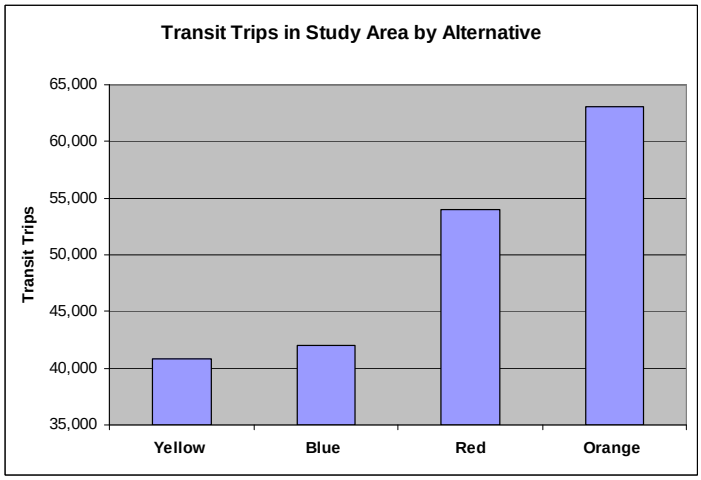
North-South Average Free Flow Speed versus Congested Speed



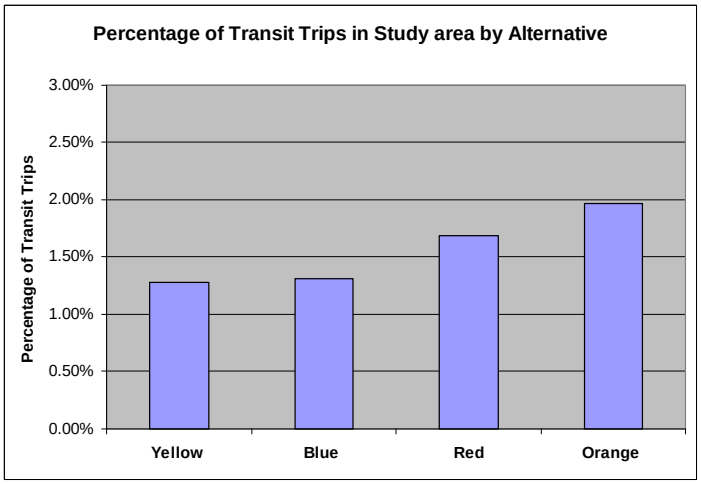
East-West Average Free Flow Speed versus Congested Speed



Transit Trips Weekday



Percent of Transit Trips



Steering Committee Evaluation Criteria

The Steering Committee has specific responsibility for providing evaluation criteria to be considered by the Consultant Team on each of the proposed transportation packages. On April 23, 2008 the Steering Committee met and was provided with a presentation that introduced each of the transportation alternatives along with established transportation planning evaluation criteria. During the presentation of the four alternative packages, the individual Steering Committee members were asked to vote on specific criteria that would help in the development of the preferred package of projects. This preferred package would result in a vision of transportation improvements in the Study Area along with a five year list of projects. After the presentation by the Consultant Team and discussion by members of the Steering Committee, the following criteria were also applied in the selection process: cost of packages, travel patterns, balance of north/south and east/west roads and traffic congestion.

Many comments were received and incorporated in the Preferred Transportation Package.

Preferred Alternative

Based upon feedback from the Steering Committee, combined with the established evaluation criteria, a package of transportation projects was selected that represented a vision of transportation improvements in the Study Area. The Blue Alternative provided a base of projects that was modified to reflect the preferred set of transportation projects that would best serve the transportation needs of local residents in the Study Area. The project list is now referred to as the Preferred Transportation Package. All the proposed additions and deletions of specific projects were finalized with members of the Steering Committee, Working Groups and members of the general public in open house forums prior to analysis through transportation modeling.